

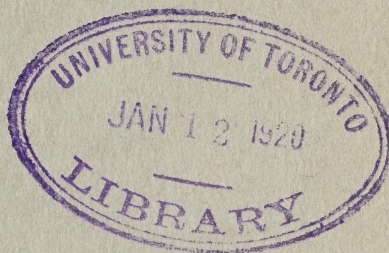
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Canada National Development Bureau

THE PROVINCE OF NEW BRUNSWICK ITS NATURAL RESOURCES DEVELOPED AND UNDEVELOPED

COMPILED FROM ALL AVAILABLE INFORMATION
INCLUDING THAT FURNISHED BY FEDERAL
AND PROVINCIAL SERVICES

1918



DEPARTMENT OF THE INTERIOR
CANADA

Honourable ARTHUR MEIGHEN
Minister

W. W. CORY, C.M.G.
Deputy Minister

Prepared in the
Natural Resources Intelligence Branch
under the direction of
F. C. C. Lynch, Superintendent

OTTAWA
J. DE LABROQUERIE TACHÉ
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
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GEOGRAPHICAL SITUATION AND CLIMATE.

The close proximity of the province of New Brunswick to the raw commodities of the United States, Cuba, Brazil, Australia, New Zealand and the Argentine Republic is an asset which doubtless will be developed to a far greater extent in the near future. The following table indicates the advantages St. John possesses over Liverpool in respect of accessibility to these markets.

Nautical Miles from St. John.	Nautical Miles from Liverpool.	To
560	3,071	New York.
1,570	4,116	Havana.
4,748	5,138	Rio Janeiro.
10,289	12,525 via Panama.	Melbourne.
8,829	11,065 “	Wellington.
5,735	6,123 “	Montevideo.

The port of St. John has direct ocean connection by established lines with the United Kingdom, Europe, South Africa, New Zealand, Australia, West Indies, British Guiana and United States ports.

Its total import and export trade during the fiscal year of 1917 amounted to \$206,087,220, a sum exceeded by only one other ocean port in Canada, that of Montreal. St. John has a shorter rail haul to and from the West than any other port in eastern Canada. Its harbour is easy of entrance, open the whole year round and is never affected by ice. The very comprehensive scheme of development, a considerable portion of which has already been carried out will give to the harbour of St. John every facility in the future.

Climate.

New Brunswick enjoys weather generally favourable to the pursuit of agriculture; the winters are followed by warm pleasant summers with plenty of rainfall. Vegetation shows a remarkably fast development, but the late spring and the early fall frost necessitate the growth of those crops that develop in a little over three months. The cool nights in summer are of great assistance to the dairy industry giving milk and cream the care necessary for good quality in cheese and butter.

The climate in the north is more severe than in the southern portion of New Brunswick with heavier snowfall and longer winters. Occasional summer frosts occur, but usually are not serious enough to injure to any extent hardy crops.

In the interior of Restigouche county, though no meteorological data are available, the opening of spring would appear to be two or three weeks later

than along the St. John valley in York and Carleton counties and the general spring planting cannot be undertaken before May 15th to June 1st. Growth, however, once started seems to develop faster than further south; the late chief forester, Mr. Caverhill, stated in his 1916 report that on July 15th, timothy was in bloom, barley headed, oats heading and potatoes well advanced and that the harvest was as early as in Carleton county. Summer frosts have been frequent during the years in which settlement has existed on these lands. About the middle of July, Mr. Caverhill has observed signs of frost on the potato fields but it was not of a killing nature and the crops were generally ripened without injury and there is no doubt that when the land is cleared and cultivated summer frosts will not be of great consequence.

In the county of Madawaska the growing season extends from about June 1st to August 20th after which date frosts of a killing nature may be expected. The climate is only suited for the production of the hardier crops and those maturing in less than three months.

The long, cold winters with abundance of snow, especially in northern New Brunswick are of especial service to the lumber industry, giving every facility for haulage on cheaply constructed roads.

The table on page 7, compiled from the records of the Dominion Meteorological Service, Toronto, gives the temperature and precipitation during the year 1916, together with their difference from the average temperature and precipitation taken over a number of years.

To aid comparison with climatic conditions in the Prairie Provinces, the following additional figures are of interest.

Province.	Mean Temperature.	Average growing season. Temperature.	Mean Annual Precipitation.
	Degrees Fahr.	Degrees Fahr.	Inches.
Manitoba.....	36.0	56	20.0
Saskatchewan.....	36.0	55	16.75
Alberta.....	38.8	60	16.1

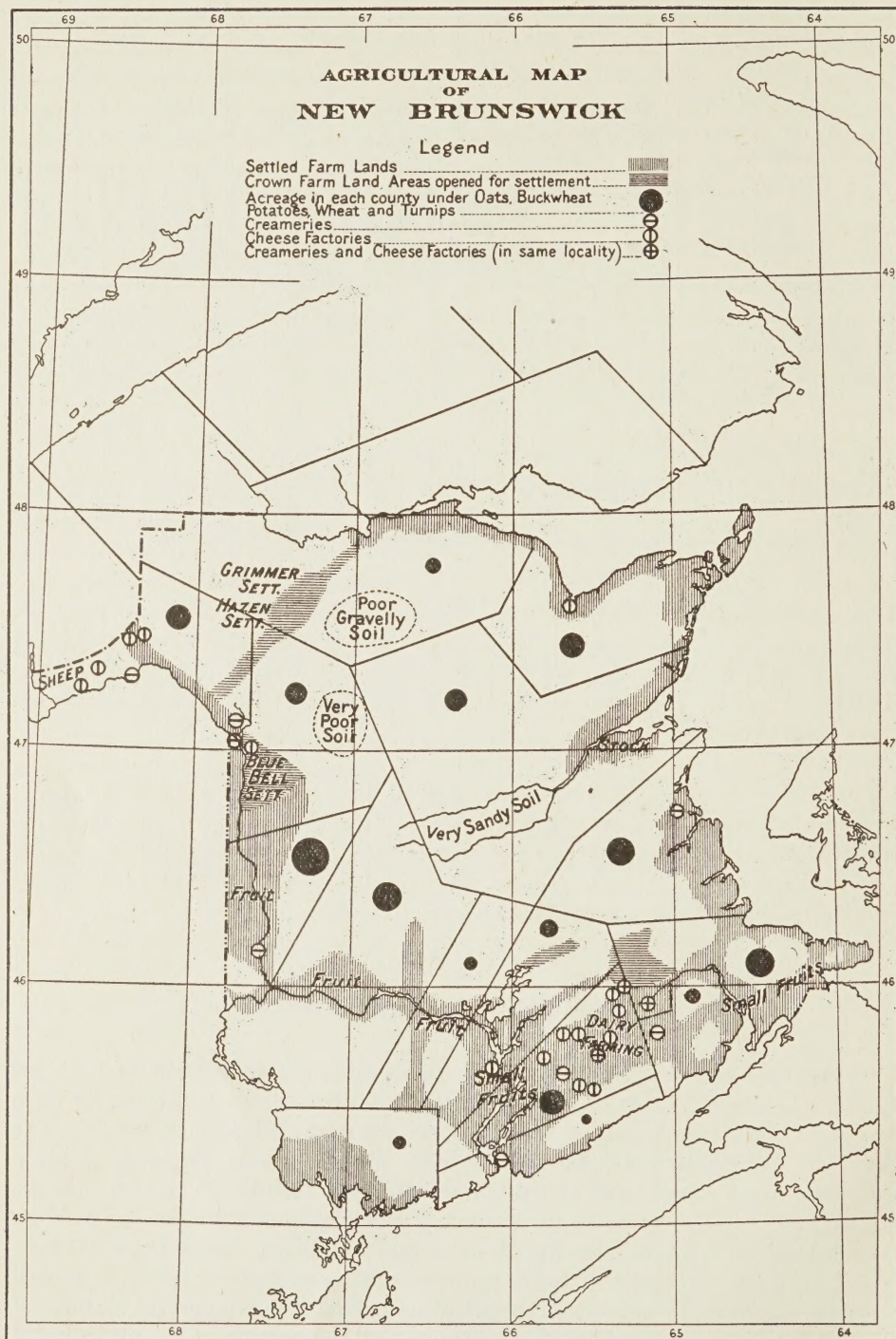
Station.	JANUARY.						FEBRUARY.						MARCH.					
	Tempera- ture Deg. Fah.				Precip- itation in Inches		Tempera- ture Deg. Fah.				Precip- itation in Inches.		Tempera- ture Deg. Fah.				Precip- itation in Inches.	
	Mean	Difference from average.	Highest.	Lowest.	Total amount.	Difference from average.	Mean.	Difference from average.	Highest.	Lowest.	Total amount.	Difference from average.	Mean.	Difference from average.	Highest.	Lowest.	Total amount.	Difference from average.
Chatham.....	15	+ 4	49	-14	2.47	-1.11	14	0 45	-19	2.51	-0.28	19	- 6	59	-12	1.59	-1.54	
Edmundston.....	16	..	..	..	5.95	..	10	..	38	-30	3.65	..	16	..	57	-19	1.50	..
Fredericton.....	16	+ 3	47	-15	2.43	-1.28	14	- 1 45	-20	2.80	-2.86	20	- 6	60	-17	2.05	-2.67	
Moncton.....	18	+ 1	50	-11	1.90	-0.51	14	- 2 45	-20	0.95	-1.83	21	- 2	57	- 8	1.65	-0.56	
St. John.....	20	0	45	- 9	2.80	-1.74	19	+ 1 46	-12	2.48	-0.79	23	- 7	53	25	2.29	-1.78	
APRIL.							MAY.						JUNE.					
Chatham.....	39	+ 4	58	20	2.47	-0.28	51	+ 1	76	32	3.50	+0.68	60	00	82	37	4.42	+1.39
Edmundston.....	40	..	67	25	0.60	..	51	..	78	24	5.45	..	60	..	80	35	4.10	..
Fredericton.....	42	+ 3	66	18	1.76	-1.21	52	+ 1	76	30	3.31	+0.09	60	0	81	39	6.31	+2.60
Moncton.....	38	0	57	18	1.70	-0.83	50	0	73	27	2.25	-0.13	59	+ 1	80	32	3.60	+0.79
St. John.....	41	+ 2	59	24	2.48	-1.03	48	0	64	34	1.81	-2.10	56	00	74	40	5.33	+2.26
JULY.							AUGUST.						SEPTEMBER.					
Chatham.....	68	+ 1	96	42	4.48	+0.76	68	+ 4	94	43	2.85	-1.15	58	+ 1	84	35	2.32	-0.81
Edmundston.....	65	..	91	45	4.70	..	67	..	95	40	2.30	..	58	..	85	30	2.07	..
Fredericton.....	67	+ 1	93	43	5.06	+2.03	66	+ 3	94	38	1.29	-2.68	57	+ 1	83	34	3.16	-0.38
Moncton.....	65	0	91	41	4.75	+1.77	65	+ 2	87	39	1.55	-2.12	56	+ 1	83	30	1.86	-1.03
St. John.....	59	- 2	77	48	5.50	+2.60	61	0	80	46	1.69	-2.16	56	- 1	80	40	1.82	-1.82
OCTOBER.							NOVEMBER.						DECEMBER.					
Chatham.....	46	+ 1	82	26	4.07	+0.38	30	- 3	64	3	2.82	-1.00	25	+ 7	48	- 9	7.10	+3.92
Edmundston.....	44	..	80	21	1.80	..	28	..	67	- 1	1.89	..	16	..	44	-10	3.82	..
Fredericton.....	46	+ 3	81	20	3.58	-0.49	30	- 3	66	- 5	2.37	-1.70	22	+ 3	52	-10	5.26	+1.81
Moncton.....	46	+ 1	79	20	2.74	-0.53	30	- 4	66	- 1	0.97	-2.29	24	+ 2	50	- 7	4.85	+2.24
St. John.....	48	+ 1	75	30	4.31	+0.16	34	- 3	54	9	2.55	-1.27	26	+ 2	50	- 1	5.10	+1.07

NOTE.—Precipitation = Rain plus snow (reduced to rain).

FARM LAND AND FARMING.*

The land and water areas of New Brunswick are 17,863,040 and 47,360 acres respectively. Over 10,000,000 acres are estimated to be suitable for farm purposes. At present only 4,500,000 acres are occupied as farm lands. The province still holds 7,000,000 acres which though mostly timbered contain extensive areas which will prove suitable for agriculture, if cleared. These Crown lands can be obtained by settlers as free grants of 100 acres by residing on the land for 8 years, clearing 10 acres and building a house 16 by 20 feet. The Crown permits no land to be thrown open for settlement unless it is well served by roads and is adaptable to agriculture. One of the important features of the present forest survey is the classification and delineation of the agricultural

*Revised by the Dominion Experimental Farms Branch of the Department of Agriculture, Ottawa.



lands, the objects being to direct future settlement to suitable farming localities and to prevent the denuding of purely timber land under the guise of clearing for agricultural purposes. In 1912 the Provincial Government passed an act authorizing the formation of a Farm Settlement Board for the purchase of lands suitable for farming to be improved by the erection of buildings and fences and to be sold to settlers at the cost price on terms extending over ten years. In 1916 an act authorized the Government to borrow \$1,000,000 in order to improve Crown lands by erecting buildings, constructing roads, etc., to be settled upon by returned soldiers from the armies of Great Britain and her allies. Under this scheme it is proposed to reserve in the centre of each colony 160 acres to be farmed by the Government, where teams and implements will be available to hire for use of settlers not able to buy for themselves, and where employment would be given to settlers in special cases. Near this central farm would be situated the school, church, store and creamery. The price to be charged the ex-soldiers on these lands would be the actual cost of improvements. The first payment would be 5 per cent of the total amount, the balance being extended over 20 years.

The principal areas that have been opened for settlement are in the counties of Victoria, Restigouche, Westmorland and Queens. The Blue Bell tract in Victoria county has an area of 50,000 acres and has excellent railway facilities. It is a rolling upland covered with a fine growth of trees free from underbrush. The soil is reddish loam with clay subsoil and well watered by the Tobique river; 7,000 acres are at present available in 100 acre lots for sale at \$1 per acre. The terms are \$25 cash and the balance in three equal annual instalments, the conditions of settlement being similar to those of the free grant lands.

Throughout the Province 166 grants were issued during the year ending October 31st, 1916, comprising an area of 15,400 acres. The county of Restigouche leads all other counties in this respect owing to the new and extensive settlements covering 10,000 acres of free grant lands on the railroad between Campbellton and St. Leonards. The following statement gives the land grants issued in each county during 1916.

County.	Number.	Acres.
Restigouche.....	48	5,422.35
Gloucester.....	16	11,210.06
Northumberland.....	19	1,681.12
Kent.....	13	952.00
Westmorland.....	3	420.00
Albert.....	3	200.00
Charlotte.....	1	100.00
Kings.....	2	84.00
Queens.....	2	200.00
Sunbury.....	2	200.00
York.....	5	450.00
Carleton.....	8	727.90
Victoria.....	15	1,123.65
Madawaska.....	29	2,635.00
Total in 1916.....	166	15,406.08
Total in 1915.....	138	10,590.00
Total in 1914.....	201	17,879.00

The vast tracts of marsh land near the mouths of rivers flowing into the bay of Fundy have been reclaimed by dyking. They are remarkably fertile producing enormous crops of excellent hay year after year without the aid of any fertilizer. The Tantramar marshes are famous. They are $13\frac{1}{2}$ miles long and 4 to 8 miles broad, situated in Westmorland county, south-east of Sackville.

The rivers of New Brunswick run through areas of low-lying alluvial land extending for miles back from the river but, as a rule, not more than a mile in width. They are more or less covered with water in the spring; but without dyking and without manure an abundant crop of hay is produced every year.

The counties with the largest areas of fertile land are Carleton, Victoria, Madawaska, Restigouche, Kings and Queens.

Mr. James Gilchrist, superintendent of Immigration and Colonization, and Secretary of the Farm Settlement Board in New Brunswick, states that there are tracts of land not just suitable for dairy farming or stock raising on an extensive scale, but which, he believes, could be very profitably used for the cultivation of beans and small fruits. At present the greater portion of the beans consumed are imported either from Ontario or the United States. In other places the soil is a deep rich muck, which could be drained and used to produce celery and onions, the greater bulk of which latter are imported. Combined with these there is great opportunity for raising poultry and bee keeping. The poorer parts of the land, such as the hill sides could be very profitably used for sheep pasture, for the land is cheap.

Field Crops.

Oats, buckwheat, wheat, potatoes and turnips are the principal crops. The quantity of wheat produced is considerably smaller than it should be, for the province is well adapted to the growth of this cereal. The following table gives the acreage and yield of these crops for 1916 compared with 1913.

	1916.		1913.		Average yield per acre for last 18 years.
	Acres.	Bushels.	Acres.	Bushels.	
Oats.....	194,311	5,883,963	185,432	5,876,691	29.6
Buckwheat.....	45,210	1,082,183	48,319	1,211,071	22.6
Potatoes.....	44,583	8,148,807	47,702	9,092,393	154.0
Wheat.....	14,367	284,985	12,389	242,369	18.8
Turnips.....	9,135	4,189,203	7,918	3,604,275	452.7

In 1915 upwards of 570,000 acres were under hay and the yield was from 1 to $2\frac{1}{2}$ tons per acre.

Dairy Farming.

The principal counties operating creameries and cheese factories at the present time are Kings, St. John, Westmorland, and Madawaska.

The total production of butter and cheese in the Province is as follows:—

Year.	Number of creameries in operation.	Lbs. of butter made.	Average price per Lb.	Value of Butter.
			cts.	\$
1916.....	21	709,932	33·27	236,194·38
1913.....	20	927,876	28·22	261,892·85
1910.....	16	821,858	24·75	203,411·71
1906.....	41	967,203	22·50	217,642·66

NOTE.—The large increase in the consumption of milk and the manufacture of ice cream in the cities account for the falling off in the butter production.

Cheese Factories.

Year.	Number of Cheese Factories in Operation.	Lbs. of Cheese made.	Average price per lb. of cheese.	Value of cheese.
			cts.	\$ cts.
1916.....	25	1,185,664	17·77	210,695·49
1913.....	24	1,049,962	12·60	132,397·85
1910.....	24	1,053,001	11·23	118,243·50
1906.....	42	1,320,858	11·07	156,321·05

New Brunswick is especially adapted to dairying. There is always excellent pasturage during the summer months. Turnips, mangels and sugar beets grow luxuriantly and are largely used for winter feed.

Live Stock.

The New Brunswick market is largely supplied with beef from Ontario and Western Canada. The local supply never equals the demand, yet the Province with its well watered grass lands and a long grazing season should be in a position to be an exporter of beef.

There are excellent opportunities too, for a large extension in sheep raising. There is always a ready market for New Brunswick lamb and mutton in the States and for the wool in the factories of the Maritime Provinces. Excepting British Columbia, the provinces of New Brunswick and Nova Scotia hold now the only extensive areas of naturally suitable lands in Canada for the cheap production of wool and mutton. These natural advantages have been very

little utilized up to the present. The climatic conditions of New Brunswick are excellent for the easy production of grass, hay and roots, the principal foods sheep require.

As in the case of beef and mutton the market for pork and pork products is not nearly supplied by the producers in New Brunswick, over one million dollars worth being annually imported. The following table shows the live stock raised in New Brunswick for the years 1916 and 1913 according to the information given in the Provincial Crop Reports for those years.

County.	Horses.	Cattle.	Sheep.	Swine.
Westmorland.....	8,206	37,425	16,268	11,041
King's.....	7,297	35,674	16,764	11,341
York.....	7,544	25,682	15,559	8,285
Carleton.....	7,977	20,010	12,153	8,225
Kent.....	4,914	21,741	13,618	6,961
Northumberland.....	4,644	17,744	9,785	5,723
Gloucester.....	3,693	13,526	10,826	8,122
Madawaska.....	3,320	10,593	11,951	5,101
Queen's.....	3,487	14,359	7,256	5,158
Charlotte.....	3,422	10,400	7,825	4,212
Albert.....	2,880	12,934	4,016	3,227
Victoria.....	3,156	7,233	4,024	3,317
Sunbury.....	1,936	8,459	2,715	2,280
Restigouche.....	1,864	5,346	3,924	2,356
St. John.....	1,599	6,483	2,199	2,499
The Province, 1916.....	65,939	247,609	138,883	87,847
The Province, 1913.....	63,303	247,214	146,869	85,230

Fruit Farming.

Under a thorough inspection service applied at the points of production and packing, as well as in the markets, the fruit industry is capable of enormous development. New Brunswick is 3,000 miles nearer to the European and West Indian markets than the fruit growing district of British Columbia and the Western States. The amount of fruit placed annually on the market is still small.

The lower St. John valley contains first class apple land, especially along the river around French and Maquapit lakes, in the Grand lake region and in the valleys of Washademoak, Belleisle Bay and the Kennebecasis. In the upper St. John Valley the earlier varieties are most successfully grown between Fredericton and Woodstock. Throughout the length of the St. John valley small fruits can be cultivated. Mr. Peters, the Dominion Fruit Inspector for New Brunswick states that in 1916, strawberries, one of the principal crops under cultivation, came through the winter in good condition. Only a few sections suffered from late frosts during the blossom stage. The growth of foliage was strong and luxuriant. The fruit set well and the very timely rains during the fruiting season gave large and luscious fruit. There was no over production and

fruit sold readily and for the best prices. Local markets absorbed principally all the berries produced along the valley of the St. John and its tributaries. The principal berries exported were grown at Upper Sackville, in Westmorland county. The strawberry growing districts shipping fruit to St. John in 1916 were the St. John Valley, both sides of the river from Gagetown to Westfield; the valleys of Washademoak, Belleisle Bay and The Kennebecasis which include Clifton, White Head and Milkirk. These last give the best berries that reach the market.

The total production of strawberries in 1916 was estimated at 400,000 boxes, 130,000 of which were produced at Sackville and shipped largely to Sydney, Halifax and the northern towns of Chatham, Newcastle and Campbellton.

There seems to be an opening for increased production of all the small fruits, especially strawberries. The total production has greatly fallen off in the past four years due doubtless to the shortage of help to gather the fruit.

FORESTRY.

The timbered lands of New Brunswick, under proper administration will continue to form one of the principal natural assets of the Province.

There are approximately seven and one-half million acres of Crown timber land and four and one-half million acres of privately owned timber berths.

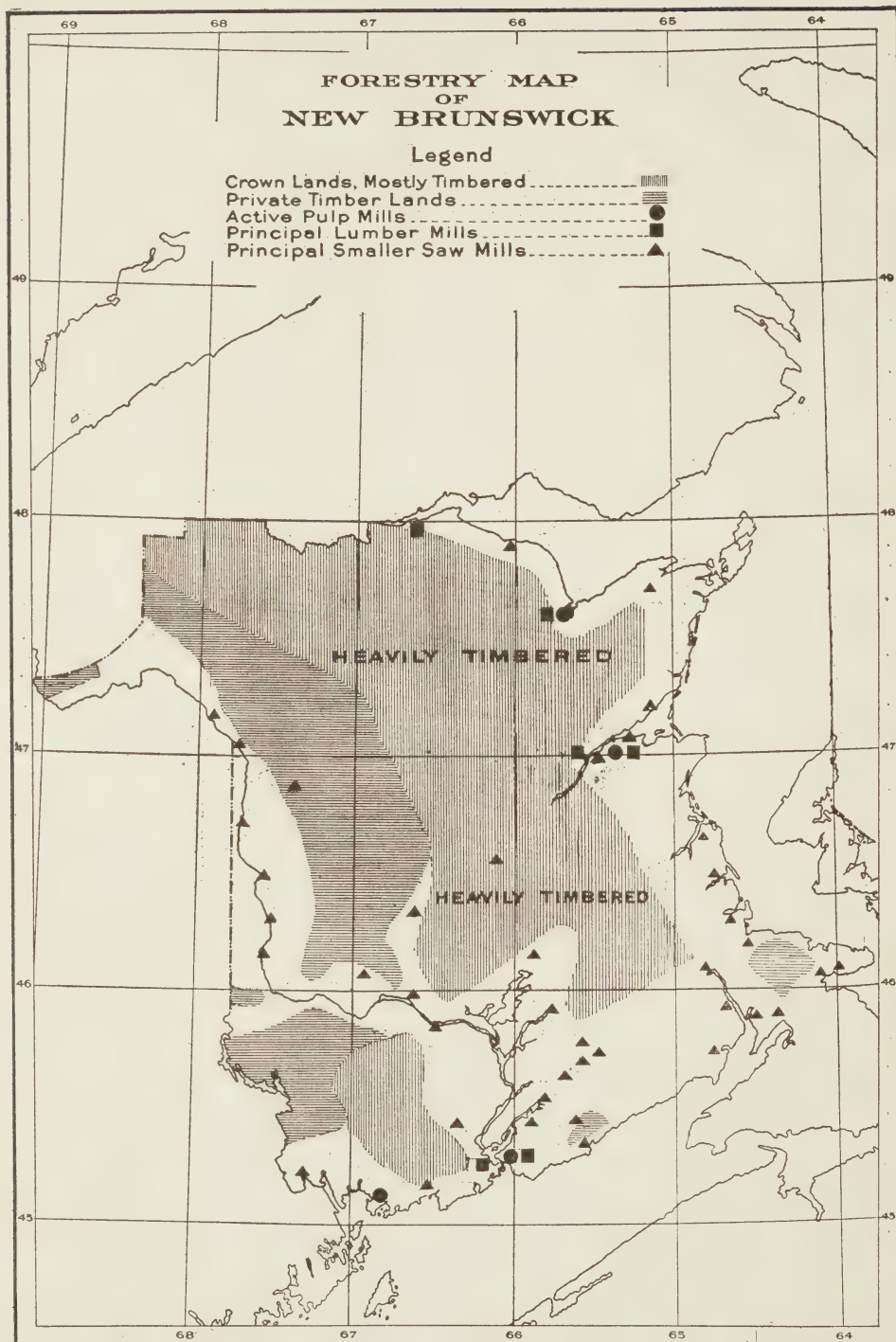
The value of the lumber industry of New Brunswick in 1916 was slightly over thirteen million dollars compared with fifteen million dollars in 1915, as shown by the following table.

Sawn Lumber—Softwoods.....	500,387	} M Ft. B.M. valued... \$8,384,397
Hardwoods.....	13,268	
Lath.....	225,366	“ “ ... 547,809
Shingles.....	359,583	“ “ ... 724,222
Pulpwood (used for manufacture)....	79,594 cords	“ “ ... 591,705
Pulpwood (exported).....	127,730	“ “ ... 726,293
Pulp Products.....	estimated at.....	1,500,000
Poles, Ties, etc.....	“	300,000
Wood Using Industries.....	“	250,000
Total.....		\$13,024,426

This does not include wood used by settlers and others, which would add at least another million dollars to the above total.

The annual revenue derived from the forests now exceeds half a million dollars. This includes stumpage, bonuses and ground rent. New Brunswick occupies the proud position of being second in both the per capita value of her lumber industry and revenue received from forests, the per capita value being \$40 and the per capita value of the revenue received \$1.42.

The forest survey which was provided for in the Act of Assembly of March 20th, 1913, is now well under way and according to the late chief forester's report for the year 1916, investigations have gone far enough to show that the above record could be exceeded in time, provided forest fires can be kept out and



due care exercised in logging operations in order to favour the more important and faster growing species and to utilize as closely as the market will allow the inferior and shorter lived species, many of which at the present time are not being used to their full extent.

Interesting Facts Disclosed by the Forest Survey.*

The work of surveying and classifying the Crown lands of the Province has progressed to an extent where many interesting and instructive conclusions may be drawn from the work already accomplished. To date the field parties have surveyed and examined 1,200,000 acres. Of this the mapping and compiling of 371,000 acres have been completed, giving the following result:—

282,064	acres of merchantable timber suitable for logs or pulp.
6,109	“ second growth not yet large enough for logs or pulp.
42,364	“ burnt land, on which there is sufficient reproduction to assure a future crop of timber.
33,794	“ burnt land, on which satisfactory reproduction is not yet established.
4,199	“ barren, treeless land, including caribou barren cranberry bogs, etc., swamp land not supporting commercial growth.
2,570	“ cleared or cultivated areas.

The commercial timber on the 282,064 acres of timber land is estimated as follows:—

Spruce.....	139,506	thousand board feet.
Fir.....	96,627	“
Pine.....	19,240	“
Cedar.....	34,821	“
Hemlock.....	7,474	“
Maple.....	30,034	“
Birch.....	97,956	“
Beech.....	12,838	“
Other species.....	8,366	“
Making a total of.....	446,862	“

There is in addition to the above 583,138 cords of spruce and fir pulp, 60,901 cords of poplar pulp, 84,346 cords of white birch spool wood, giving a total of 728,385 cords, which, assuming that two cords will equal one thousand board feet, will be equivalent to 364,192 thousand board feet, making a grand total of 811,064 thousand board feet on the 282,064 acres of timbered land, or an average of 2,900 feet per acre.

Again, assuming that the 371,000 acres examined is fairly representative of the entire area of 7,500,000 acres of Crown land, the total stand of all species would be approximately 16,200,000 thousand board feet, worth in stumpage at least \$48,000,000. The harvesting and marketing of this crop will distribute among the people of this province some three hundred million dollars.

Another important fact observed is that although 33 per cent of the timber stand (that is 5 or 6 billion feet) is represented by hardwoods—maple, beech and birch—yet these species form only $1\frac{1}{2}$ per cent of the annual cut of the province. A great deal of the hardwood stand is very suitable for the manufacture of

*This information has been given by the Director of the Forest Survey, New Brunswick.

flooring, dimension stock for chairs, turnery, etc., and much of it is superior in quality to that used in large quantities in the New England States for the above mentioned purposes.

Many of the stands are over-mature and deteriorating, thus making the question of utilization a very urgent one, and would it not appear wise, as well as profitable, to turn from some of the over-cut spruce stands, allow them to recuperate, and try to solve the problems of hardwood utilization.

The estimate prepared by the Forest Survey shows large amounts of poplar, and this brings forward the question of soda pulp plants and in view of the large quantity of raw material available, it would seem that a plant for the manufacture of poplar pulp would be a very paying investment.

MINERALS AND MINING.*

The science of geology has revealed that New Brunswick is a territory of large mineral prospects. At the present time, however, there are only three important branches of the mining industry on a commercial basis, and these are bituminous coal mining in the Grand Lake region, the quarrying of gypsum at Hillsborough, and the production of natural gas near Moncton. Less important industries have long been established in the production of grindstones, the quarrying and manufacture of granite, and the production of limestone and lime.

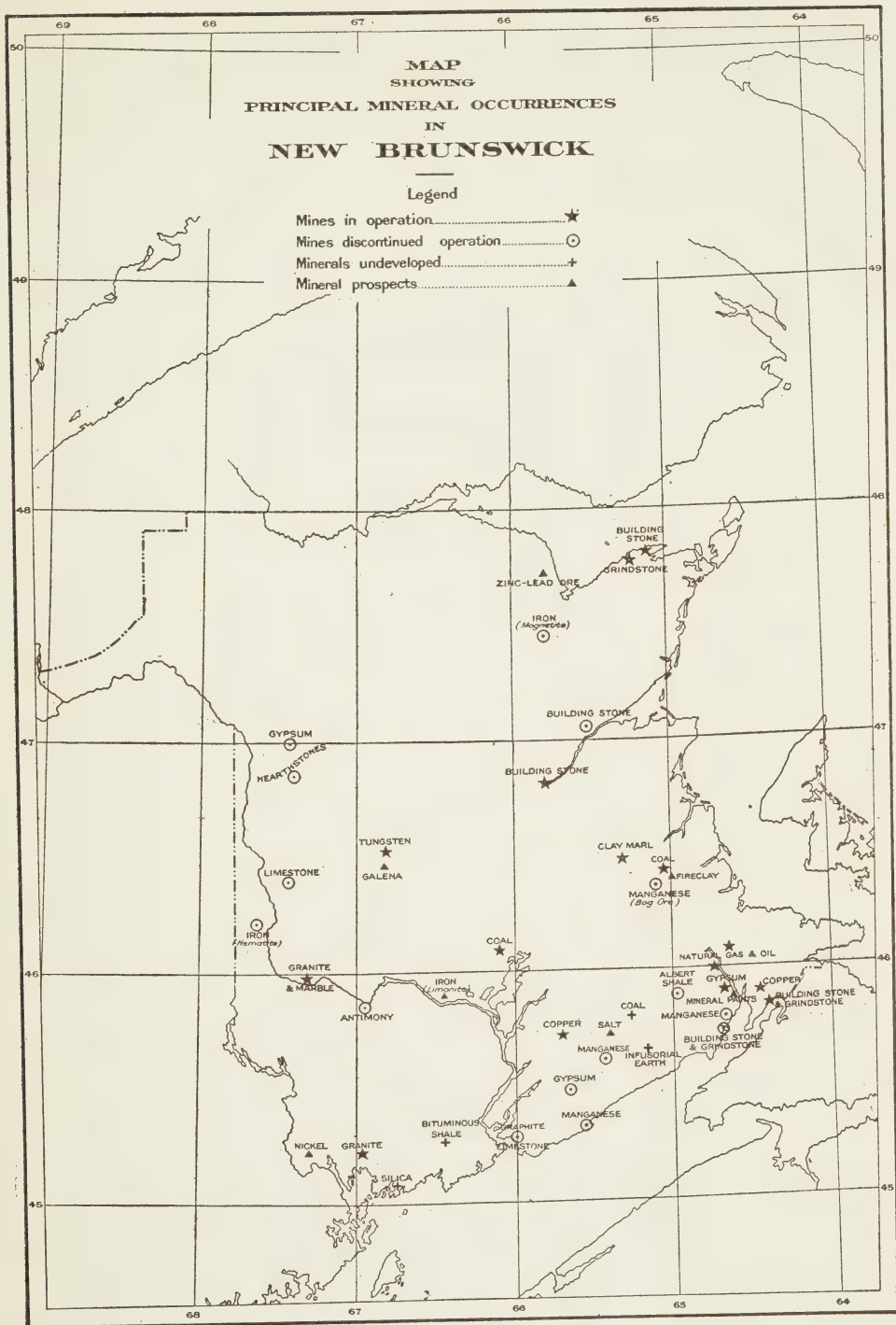
Coal mining, in spite of the deposits being only from twenty to thirty inches in thickness is nevertheless proving a very valuable industry to this Province

It is only within the last few years that through the organization of some coal companies with long term leases and a large tract upon which to work, any considerable quantity of coal has been produced. The following figures show how the output has increased since the year 1912:—

Year.	Tons.	Value.
1912.....	44,780	\$ 89,560
1913.....	70,311	166,637
1914.....	98,049	241,075
1915.....	127,391	309,612
1916.....	143,540	386,016

Practically all this coal is raised in the Grand Lake region in the counties of Queens and Sunbury. The almost universal method in times past has been to sink shafts to the coal seam, usually a vertical distance of thirty to sixty feet, and then run main levels along the coal bed with branch drifts at right angles to the main level. These branch drifts or bye levels are about thirty feet apart and as the coal seam is taken out the refuse rock and clay are stowed in

*Much of the data in this article has been obtained from the Mines Branch of the Department of Mines, Ottawa, and the Provincial Department of Lands and Mines.



its place. A man taking out coal from these thin seams works in a cramped position, the favourite method of working being to pick out the coal while sitting on a low stool. Within the last year the "stripping" method has been used by some of the operators in this district, the plan being to strip off the overburden by means of steam shovels. It is too soon yet to compare results with the method of shafts and tunnels but it is expected, in those places where the coal is not very deep that it will be economical.

The coal is used by the Canadian Pacific and the Government railways and many manufacturing concerns throughout the province.

The only other place where coal mining is now carried on is at Beersville in Kent county. Here a seam of coal from sixteen to eighteen inches thick outcrops on the banks of the Coal branch, a tributary of the Richibucto river, the outcrops being about three miles apart on the stream. In 1916 the production at Beersville was 3,896 tons compared to 5,263 tons last year.

At Dunsinane about thirty miles southwest of Moncton another coal basin occurs and several years ago a seam of eighteen to twenty inches was opened to a depth of about seventy-five feet and several tons of coal resembling that of the Grand Lake region were taken out. Up to the present time, however, there has been no mining to speak of in this locality.

Mr. Dowling of the Geological Survey of Canada has estimated the contents of the Grand Lake coalfield at 138,000,000 metric tons, giving with the addition of 13,000,000 tons for the areas at Dunsinane and Beersville, a total for the Province, of 151,000,000 metric tons.

Gypsum has been quarried at Hillsborough for a number of years and either shipped abroad to be manufactured or made into calcined plaster or hard wall plaster at the Albert Manufacturing Company's mills. These products have had a ready market in Canada and even beyond the seas but the war with its restriction of the building trade and higher freight rates has reacted to a great extent against this business. Gypsum is found in several localities throughout the Province and in quantities that may warrant development on a more extensive scale. The deposits of impure gypsum similar to those existing at Plaster Rock are also found in considerable quantities and they have proved very beneficial fertilizers on the farms in the St. John river valley and elsewhere. Anhydrous calcium sulphate or anhydrite is often found in large quantities associated with the gypsum, but no commercial use for this product has yet been developed. The tonnage of gypsum mined in 1916 was 53,000 tons compared with 78,640 tons in 1915, 86,912 tons in 1914 and 112,739 tons in 1913.

The production of **Natural Gas** by the New Brunswick Gas and Oilfields, Ltd., of Westmorland has during the last few years increased to such an extent that at the present time there are nearly three thousand users of gas in Moncton and its vicinity. The Albert Manufacturing Company uses between five and six million cubic feet per month, and the Canadian Government railways employ it for heating purposes and for their gas engines and forges at the Moncton work shop. The same company has been opening up wells at Stony Creek, Albert county. Slightly over twenty-seven thousand gallons of **oil** were produced last year and the gas at the well's mouth was considered to be worth seventy-two thousand dollars.

A few years ago an outcrop of what proved to be wolframite, an ore of **tungsten**, was discovered by a land surveyor working along the S.W. Miramichi river about twenty miles above Boiestown. For over a year now, this ore has been mined and concentrated here, not on a large scale but with some prospect of more extensive developments.

Copper was formerly mined unsuccessfully a few miles to the northeast of Dorchester. Recently in the same district very extensive development work has been performed sufficient to prove the existence of considerable deposits, but whether it can be profitably smelted is a problem which, at the present time, has not been definitely answered. The same may be said of the copper mine at Annidale, King's county.

The only known deposits of **iron** of economic interest are in the vicinity of Bathurst. Mining operations were started in 1907 and discontinued a few years ago. In all, some 180,000 tons were taken out. The ore is a siliceous magnetite, the average content of iron being from 43 to 47 per cent with about 0.8 per cent of phosphorous. According to the estimate by E. Lindeman of the Mines Department, Ottawa, based on magnetometric surveys the ore reserves are placed at 18,600,000 tons to a depth of 500 feet. The ore is too low grade to be marketed in its natural state. It would be necessary either to concentrate it or to follow a method of selective mining.

There is no iron mining at present in New Brunswick, due possibly to the low grade ore and the difficulty of concentration. Under favourable conditions, however, the iron deposits in this province may yet be developed.

Antimony has been mined intermittently near Lake George. Shortly after the outbreak of the war operations were renewed but difficulties experienced in the refining of the ore were factors in the closing down of this industry in June, 1916.

Infusorial earth or Tripolite which is extremely useful as a polishing material and for other purposes, exists in quantity as an organic deposit in Pollet lake near Anagance station, and also near St. John and opposite Westfield between the Kennebecasis and Long Reach. At not one of these places, however, is there any operation.

Manganese in the form of pyrolusite exists in several localities but the largest deposits are of the form known as wad or bog ore consisting of manganese dioxide mechanically mixed with oxides of iron, silica and organic matter. A deposit of this nature near Adamsville, Kent county, was being gathered in 1915 and shipped for reduction to New York, but for Imperial reasons an embargo was placed upon its export and at present no manganese ore is being produced in the Province.

Bituminous oil-shales are found in Albert county and from their high content of bitumen, they should form, when properly developed, one of the great mineral assets of the province. These shales are richer in oil and by-products than the Scottish shales which have been very profitably operated for many years.

Limestone is found at many widely separated points throughout the province but the production of lime is small, being only 369,117 bushels valuing

\$93,797. New Brunswick is noted for its good quality **granite**, building, paving and ornamental stone. In 1915 the total value of the stone output was only \$153,512.

Most of the Canadian production of **grindstones** and **pulpstones** comes from New Brunswick. The latter are quarried in Northumberland county by the Miramichi Quarry Company which also produces an excellent building stone for which a market has been built up in Ontario and Quebec. In 1915, the output of grindstones was 2,295 tons valued at \$30,468. More extensive production will be necessary to overcome the rather heavy importation of grindstones and pulpstones into Canada. Both brick and fire **clay** are to be found in quantity, the former being used principally in the brick works of St. John, but the latter which exists both in the Grand Lake and Beersville coal areas has never been utilized.

From the foregoing it will be seen that very little real development has been done and that the mineral wealth of the province has been but lightly tapped, a fact which is further borne out by the additional discoveries recently made of the existence of argentiferous galena and zinc-lead ore.

FISHERIES.*

The chief kinds of fish caught in the province are herring, sardines (the name given to young herring when canned), cod, haddock, hake, salmon, smelts, mackerel, pollock, alewives, shad, trout pickerel and lobsters, oysters and clams.

This province ranks third among the provinces of the Dominion in the value of its fisheries. The total marketed value of the product for the year 1916-17 was \$5,656,859, an increase of nearly one million dollars over that for the preceding year.

The amount of capital invested in vessels, boats, fishing gear and fixtures throughout the province was \$4,487,601. There were 21,799 persons engaged in the work of the fisheries, of which number 1,664 were employed on vessels and carrying smacks. 14,008 on boats, and 6,127 in canneries, smoke-houses, etc., on shore.

New Brunswick possesses the only sardine fishery in Canada. It is carried on in the waters of Passamaquoddy bay and around the islands in the bay of Fundy. Of such importance is this fishery—and in such masses do the fish appear—that the fishermen on that part of the coast depend largely upon it for their livelihood.

Herring are taken in enormous quantities along the gulf shore of the province in the spring of the year, but being somewhat poor in quality they are mainly used for lobster bait. A rapidly increasing quantity, however, is now being smoked for export to the West Indies. Herring of fine quality are taken during the fall especially in the Baie Chaleur district. These are mostly cured in pickle for home consumption. This fishery has possibilities of great development.

*This article has been revised by the Dominion Fisheries Branch, Department of the Naval Service.

A very important New Brunswick fishery is the smelt fishery. The smelt, though common on all the shores of eastern Canada, is taken in greatest numbers on the gulf shore of this province. That section of the coast alone produced in the year 1916-17, 54,954 cwts. valued at \$714,402, which constituted more than two-thirds of the whole catch of smelts in Canada.

New Brunswick has by far the best salmon fishery in eastern Canada.

Oyster cultivation, under the development and protection of the Dominion Government, appears to have excellent possibilities. The Shemogue Oyster Company, Limited, began in June, 1916, planting oysters on the barren bottoms of its Shemogue beds, transferring the seed from Richibucto River, planting altogether 4,947 bushels. In 1913, this company removed 1,800, and in 1914, 2,200 barrels of oysters from Richibucto river. In the opinion of Ernest Kemp, oyster expert to the Dominion Government, there are probably over 50,000 barrels of oysters in Richibucto river to-day, and he considers that no material loss would result if three or four thousand barrels were removed annually; in fact the quality of those remaining would be improved.

The Canadian oyster is superior to any other, and retains its excellent flavour even after much transportation.

The following table taken from the 1916-17 report of the Dominion Fisheries Branch, gives by districts the quantities of the chief kinds of fish landed and comparative figures for the year 1915-16.

DISTRICT No. 1.

Comprising the Counties of Charlotte and St. John.

Kinds of Fish.	1916-17.	1915-16.
	Cwt.	Cwt.
Lobsters.....	6,540	9,232
Herring.....	243,243	169,460
Sardines (brl.).....	315,810	336,290
Pollock.....	47,295	38,165
Hake.....	98,987	123,102
Salmon.....	3,780	2,156
Cod.....	17,056	20,978

DISTRICT No. 2.

Comprising the Counties of Albert, Westmorland, Kent, Northumberland, Gloucester and Restigouche.

Kinds of Fish.	1916-17.	1915-16
	Cwt.	Cwt.
Salmon.....	13,137	15,004
Lobsters.....	92,915	62,919
Cod.....	183,504	229,935
Herring.....	296,096	512,730
Mackerel.....	11,407	19,748
Smelts.....	54,954	52,900
Clams and quahaugs (brl.).....	6,601	13,836

DISTRICT No. 3 (Inland).

Comprising the counties of Kings, Queens, Sunbury, York, Carleton, Victoria and Madawaska.

Kinds of Fish.	1916-17.	1915-16.
	Cwt.	Cwt.
Salmon.....	874	707
Trout.....	744	710
Pickarel.....	199	255
Alewives.....	6,504	2,842
Shad.....	1,435	1,422

WATER POWERS.*

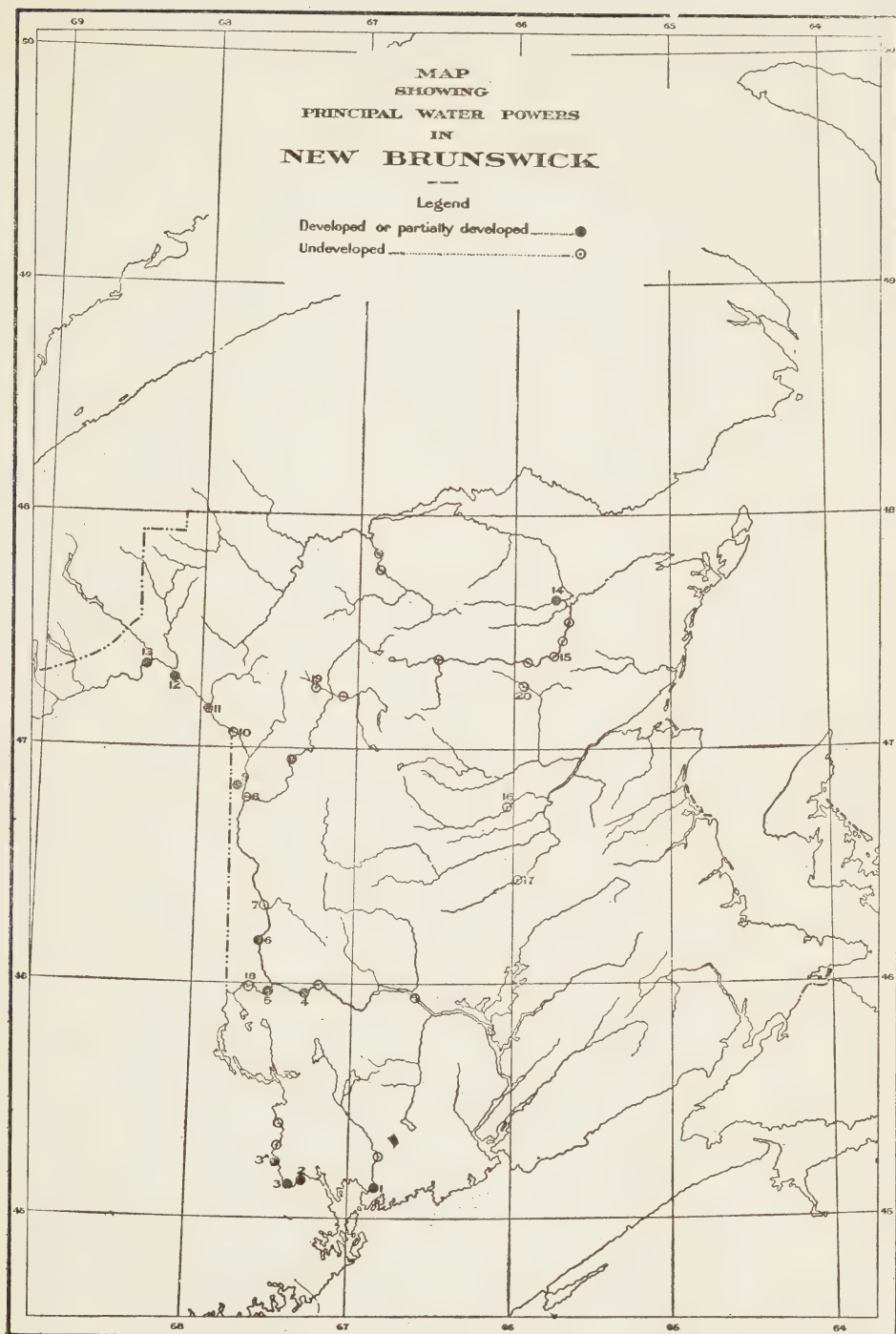
The existing water power developments in the province of New Brunswick are of two types, the one serving the requirements of the lumber industry and the other those of the municipalities, while in some cases small powers drive woollen and grist mills. The largest water power plants are used for the manufacturing of pulp and paper—an industry which has tremendous possibilities, especially in view of the fact that the large forest areas in the interior of the country can doubtless be made to produce a continual supply of pulpwood under the application of the approved forestry methods that will be the outcome of the present forest survey. Many excellent opportunities are afforded by the available supply of water power for the further development of the pulp industry.

There is a promising field too in the development of power for municipal purposes and for the application of electrical energy to agricultural pursuits, to mining operations and to industrial activity at St. John.

Developed Water Power.

The meagre sources of information available give the total developed horsepower in New Brunswick as approximately 20,000, over half of which is used in pulp, saw and grist mills. The largest electrical development is situated at Aroostook Falls on the Aroostook river but the greater part of the output is used across the border in the State of Maine. Small electrical plants exist at Bathurst, Centreville, Edmundston, St. Stephen, Shediac and Woodstock, all of which are privately owned, except the Edmundston development which is a municipal enterprise.

*Much of the data of this article has been furnished by Mr. W. E. McMullen of the Department of Lands and Mines, the Province of New Brunswick.



Undeveloped Water Power.

Grand Falls on the St. John river possesses the largest water power and one of the largest sites in Eastern Canada. The International Commission pertaining to the St. John river has compiled invaluable data covering the whole of its drainage basin, and the investigations made by the United States' Geological Survey into the inland waters of the State of Maine have been of very material benefit in the study of water power possibilities in New Brunswick and elsewhere, both directly and by analogy.

The St. John is about 450 miles long and has a total drainage area of approximately 26,000 square miles. The mean annual rainfall is low, not over 30 to 35 inches. But the general contour of the drainage surface with its heavily timbered areas tends to retain the precipitation and to help eke out the low-water flow.

The Nipisiguit—a very rugged stream in the northern part of the province—has a number of rapids and falls, the largest of which is Grand Falls, about 20 miles from the town of Bathurst. The estimated low-water 24 hour horsepower that can be developed here is placed at a minimum of 6,000 with a maximum head of 120 feet. This takes into consideration the fact that a week or two of very dry weather regularly occurs in August and again in March before spring melting or rains are felt.

A very important point to be remembered in regard to water power development in New Brunswick is the scarcity of inland lakes thereby preventing the economical creation of an artificial storage of water during the low-water period.

The following is a list of the more important developed and undeveloped water powers giving some particulars from the meagre sources of information available.

Site.	Location number on map.	Drainage area in acres.	Remarks; estimated H.P., etc.
		(approx.)	
St. Croix River, Salmon Fall.....	2	98,000	The St. Croix Cotton Mill uses 2,113 H.P.
St. Croix River, Sprague Fall.....	3	890,000	13,200 H.P. used by the St. Croix Paper Co. (U.S.A.).
St. Croix River, Grand Falls.....	3a	870,000	8,000 H.P. used by the St. Croix Paper Co. (U.S.A.)
Nipisiguit River, Grand Falls.....	15	2,000,000	6,000 H.P. at low water; undeveloped; head 120 feet.
Aroostook River, Aroostook Falls...	9	1,800,000	77 foot dam with 5,100 H.P. at low water and 11,000 H.P. at high water.
Magaguadavic River, St. George Falls.	1	440,000	2,800 H.P. developed; can be made larger.
St. John River, Grand Falls.....	10	11,600,000	Undeveloped; estimated at 90,000 H.P.; by means of storage may be increased by 30,000 H.P.

Site.	Location number on map.	Drainage area in acres.	Remarks; estimated H.P., etc.
		(approx.)	
Tobique River, The Narrows.....	8	780,000	Falls 40 feet; 4,300 H.P. at low water; 10,000 H.P. at high water.
Southwest Miramichi, Grey Rapids*	17	1,300,000	Approx. head of 30 feet with 5,000 H.P. at low water; possible dam site.
Little S.W. Miramichi, Red Stone* Rapids.	16	350,000	Approx. head of 30 feet with 1,400 H.P. at low water; possible dam site near mouth of Catamaran brook.
Northwest Miramichi Falls.....	20	64,000	Estimated 470 H.P. at low water; possible dam site with head 60-80 feet.
Madawaska River, Edmundston...	13	2,530,000	22-foot dam with 940 H.P. at low water.
Green River.....	12	170,000	35-foot dam with 1,400 H.P. at low water.
Grand River, St. Leonards.....	11	80,000	30-foot dam with 800 H.P. at low water.
Becaguimec River.....	7	60,000	By erecting at the entrance to the St. John river at Hartland a 50-foot dam, about 1,000 H.P. could be developed.
Meduxnekeag River.....	6	174,000	500 H.P. with 30-foot dam developed by the Woodstock Electric Co., could possibly be increased 50% by the use of improved wheels.
Tetagouche River.....	14	95,000	Developed by the Bathurst Electric Co., with a 60-foot dam giving 500 H.P. at low water; rapids below the dam might be developed in two places for 400-500 H.P. each.
Pokiok River.....	4	35,000	150 H.P. developed and capable of expansion by 200 H.P.
Eel River.....	18	90,000	Undeveloped, estimated at 1,600 H.P. at low water with a 40-foot dam.
Eel River*.....	5	140,000	Saw and grist mill, possible 40-50-foot head.
Sisson Branch Falls.....	19	45,000	About 400 H.P. at low water; undeveloped.

**"Water Powers of Canada." Commission of Conservation.

HUNTING AND ANGLING PRIVILEGES.

Of the total receipts of \$540,386 for territorial revenue for the year ending October 31, 1916, game licenses contributed \$45,133.80 compared with \$40,730.74 the previous year. The following is a list of the game killed :—

County.	Moose.	Deer.	Caribou.
Albert.....	138	162	
Carleton.....	87	537	2
Charlotte.....	128	169	
Gloucester.....	61	64	6
Kent.....	131	131	
Kings.....	62	161	
Madawaska.....	35	47	1
Northumberland.....	235	483	80
Queens.....	133	293	6
St. John.....	98	60	
Sunbury.....	111	175	1
Westmorland.....	123	195	
York.....	171	349	7
Total.....	1,511	2,826	103

NOTE.—Restigouche and Victoria counties were not heard from.

The largest moosehead seen in Sussex for some years was brought in from Arnold lake; the antlers had a spread of sixty-four and one-half inches.

It is estimated that New Brunswick has more big game to the square mile than any other province in Canada. Of the small game, duck, geese, partridge, snipe and woodcock are very plentiful. The head of the Tantramar marshes is the finest snipe ground in the province. Very many kinds of duck are to be found on the bay of Fundy and the gulf coast of St. Lawrence in the spring and fall.

The fishing leases and angling licenses yielded in 1916 a revenue of \$20,317.70 compared with \$20,643.50 the previous year. The fishing rights on the Restigouche river alone, which is one of the finest in the world for salmon angling, bring in annually \$12,000. Fishing privileges of this nature are becoming more valuable and doubtless in the future a much greater revenue will be derived therefrom.

The province is famed for its numerous salmon and trout rivers.

Mr. T. F. Allen, superintendent of the Tobique Salmon Club, speaks of two club records as having been broken in 1916, a record salmon of 31½ pounds weight having been taken, and ten salmon taken on one day from one pool by one man.

Of other fish, sturgeon, pickerel, whitefish, eels, bass and perch are to be obtained. The catch of bass has been falling off lately. Limited quantities of whitefish, a very choice food fish about the size of the herring, are found in the St. Croix waters, York county, the Salmon river, Victoria county, and Baker lake, Madawaska county.

There is no doubt that the province of New Brunswick with its magnificent scenery and beautiful canoe routes through the heart of its vast forest areas and with the excellent opportunities it affords for the best possible hunting and angling, is capable of deriving a tremendous revenue from tourist traffic.

As yet there are no provincial Parks or Forest Reserves. The Dominion Government has set aside a small area of about 19 acres with the object of commemorating the landing of the United Empire Loyalists and preserving the historic site of Fort Howe built just after the American Revolution.

In 1917 the number of tourists entering New Brunswick was not so large as during the previous year; this was due mainly to war conditions in the United States.

The road department of the province during the past year or two has been very energetic in its efforts to improve road connections between the border at St. Stephen and St. John. This road is the chief avenue of entrance from the United States to the province, and the maintenance of this road in a good condition will have a very important bearing on tourist travel in the future.

The scenic attractions of the St. John river are difficult to excel, but owing to a very inadequate steamship service its beauties are rarely seen by the tourist. The establishment of an up-to-date steamboat service would hold out an excellent inducement to the tourist and would encourage the development of many beautiful fishing and hunting resorts.

FUR-BEARING ANIMALS AND FUR-FARMING.*

The success achieved by the fur farmers of Prince Edward Island has been instrumental in the development of this industry in New Brunswick. The first fox farms were formed in 1910. In 1912 there were 30 silver, 10 cross, 50 bastard and red foxes in captivity, and 8 ranches. By April 1st, 1914, 47 fur farming companies had been incorporated with a total capitalization of over \$4,000,000. Substantial profits have been realized. In spite of the war having militated very considerably against this industry it is expected that with the close of the war and with improved financial conditions there will be excellent opportunities for the further extension of the domestic fur farms. Port Elgin in Westmorland county is the centre of the silver fox industry.

The principal fur-bearing animals to be found in New Brunswick are black bear, fox, lynx, beaver, raccoon, sable, martin, mink, otter and muskrat.

*"Fur-Farming in Canada." Commission of Conservation, 1914.



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